

**MOLECULAR ASSEMBLY LINES, MEMORY, SHIFT
REGISTERS, AND BI-STABLE SWITCHES**

ABSTRACT

This invention generally relates to solution-based molecular shuttle devices. More particularly, this invention relates to solution-based molecular switches, molecular assemblies, and molecular memory devices and methods for producing the same. In some embodiments the devices are made from molecular chains constructed from molecular subunits which define binding positions and shuttles that are capable of moving along the chains.